Harrison Park Trail Construction

BID PACKAGE

OCTOBER 2011

INDEX

GENERAL

ADVERTISEMENT FOR BIDS

Harrison Park Trail Construction

Gilmer County
Ellijay, Georgia

Sealed bids will be received for a contract that includes: **grading; trail construction; and installation & maintenance of erosion control measures**.

An optional prebid meeting will be held at **Ellijay City Hall** on **Wednesday 10/26/11** at **11:00 a.m.** All bidders are encouraged to attend.

Bids will be received by the City of Ellijay, located at 197 North Main Street, Ellijay, Georgia 30540, until **12:00 p.m. (noon), Wednesday 11/02/11** and publicly read.

Bids must be accompanied by a bid bond in the amount not less than **5%** of the base bid. A performance bond in the amount equal to **100%** of the contract amount and a payment bond in the amount equal to **110%** of the contract price will be required. Bids should reflect a **10%** DBE Goal.

Bid Documents may be examined and/or obtained at Ellijay City Hall, located at 197 N. Main Street, Ellijay, GA 30540. Bid Documents are also available for review on the City's website: ellijay-ga.gov

Written request and payment in the amount of **$40.00** per hard copy set should be filed promptly. All checks should be made payable to the City of Ellijay. Technical Questions regarding this project should be directed to: project coordinator's e-mail: awilfer@hotmail.com

The owner reserves the right to reject any and all bids and to waive any irregularities. No bid may be withdrawn for a period of 60 days after date and time set for opening the bids.

INSTRUCTIONS TO BIDDERS

1. PREPARATION TO BIDS: Execute bid fully and properly. Submit on this form via mail or hand delivery to:

City of Ellijay
197 North Main Street
Ellijay GA 30540

2. SIGNATURE: All bids, notification, claims and statements must be signed as follows:

(a) Corporation: Signature of official shall be accompanied by a certified copy of the resolution of the Board of Directors authorizing the signing to bind the corporation.
(b) Partnership: Signature of one partner shall be accompanied by a certified copy of the power of attorney authorizing the individual signing to bind all partners. If bid is signed by all partners no authorization is required.
(c) Individual: No authorization is needed. Each signature must be witnessed.

3. BID GUARANTEE: Each proposal shall be accompanied by either a certified or cashier's check on an open, solvent bank or a bid with an authorized surety company in the amount of 5% of the base bid payable to the Owner as a guarantee of good faith. If the successful bidder fails to furnish satisfactory bonds and insurance within 15 days after notice of award, such guarantee shall be forfeited to the Owner as liquidated damages. The guarantees of the three lowest bidders will be retained until the bonds and insurance of the Contractor have been approved by the Owner. The guarantees of all other bidders will be returned within ten days after bid opening.

4. REJECTION OR WITHDRAWAL: The Owner reserves the right to reject any bids and to waive any defects in bids. Bids may not be withdrawn within 60 days after opening date without forfeiting bid security.

5. CONTRACT: If the contract is awarded, it will be awarded to the reliable bidder with the lowest combination of the Total Base Proposal Sum and/or any alternates that can be selected based on the available construction budget. The proposal shall have met all the prescribed requirements.

Upon acceptance by the Owner, the Contract and the executed duplicate thereof will be returned to the Contractor. The Contract, however, shall not be in force until the Contractor has complied with all of the requirements of insurance and bonds.

6. QUALIFICATIONS: If the bid is $2,000,000.00 or more the bidder must be pre-qualified or a registered subcontractor by the Georgia DOT.

7. DISADVANTAGED BUSINESS ENTERPRISE (DBE) goal is **10** percent of the total project cost. DBE firms must be certified with the Georgia Department of Transportation's Equal Employment Opportunity (EEO) Office. DBE information and forms are located on pages DBE-1 to DBE-13 of this document. BIDDERS MUST IDENTIFY CERTIFIED DBEs PROPOSED FOR THIS PROJECT ON THE "DBE GOALS" FORM, PAGE DBE-1 OF THIS DOCUMENT.
Failure to do so means the bid package is incomplete and may be declared "non-responsive."

BID PACKET CHECKLIST

PROJECT: _____

BID DATE: _____

Enclosed with this Bid Packet are the following Forms and instructions. Use this checklist to ensure you have properly completed all Forms. You must return the following pages to be eligible for consideration on this project.

____ Bid Proposal

____ Bid Bond or Certified Check (5% of Base Bid)

____ Performance Bond (100% of Contract Amount)

____ Surety (Payment) Bond (110% of Contract Price)

____ DBE Form (10% Goal)

____ Completed Schedule of Items (Unit Prices)

____ Submit Proposal to: City of Ellijay
197 N. Main Street
Ellijay, GA 30540

If you have any questions or need additional information, contact Project Coordinator, Anne Wilfer c: 404.610.1025; e-mail: awilfer@hotmail.com or Mayor Al Hoyle at Ellijay City Hall p: 706.635.4711

PROPOSAL

OWNER: City of Ellijay
197 North Main Street
Ellijay, GA 30540

PROJECT: Harrison Park Trails
Ellijay, Georgia

PROJECT #: NRT-09(7)
COUNTY: Gilmer County

TO: City of Ellijay
197 North Main Street
Ellijay, GA 30540

The undersigned, having examined the drawings, specifications, and other contract documents, and having familiarized themselves with local conditions affecting the cost of the work, hereby proposes to furnish all necessary machinery, tools, apparatus and other means of construction, do all work, furnish all materials and equipment except otherwise specified herein; and for the lump sum named to complete the work described herein in strict conformity with the requirements of the plans and specifications entitled:

HARRISON PARK TRAILS

prepared by the City of Ellijay, including Addenda No.'s____, ____, and _____, issued thereto. The Base proposal shall be deemed incomplete unless unit prices are also submitted with the bid.

TRAILS – ENVIROGRID
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

TRAILS – ASPHALT
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

TRAILS – RUBBERIZED ASPHALT
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

TRAILS – RECYCLED RUBBER PAVING
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

TRAILS – CONCRETE PAVING
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

ADD ALTERNATE 1 (PARKING & ROADS) – ENVIROGRID
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

ADD ALTERNATE 1 (PARKING & ROADS) – ASPHALT
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

ADD ALTERNATE 1 (PARKING & ROADS) – RUBBERIZED ASPHALT
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

ADD ALTERNATE 1 (PARKING & ROADS) – RECYCLED RUBBER PAVING
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

ADD ALTERNATE 1 (PARKING & ROADS) – CONCRETE
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

<u>ADD ALTERNATE 2</u> (BOAT LAUNCH) – ENVIROGRID
TOTAL BASE PROPOSAL SUM:

_____ $_____
(written amount)

The undersigned affirms that neither he/she nor agents, officers or employees of the Contractor submitting this bid have directly or indirectly entered into any agreements, participated in any collusion, or other wise taken any action in restraint of free competitive bidding in connection with the bid for this project.

The undersigned agrees that if this proposal is accepted by the Owner, he/she will enter into the Contract, furnishing all bonds and other contract requirements within 7 days of notice of acceptance, and will complete the entire work of the contract no later than 120 days from receiving notice to proceed.

In submitting this Proposal, it is understood that the right is reserved by the Owner to reject any and all proposals.

Dated and signed at_____, State of_____

this_____day of_____, 20___.

Name of Bidder_____

by_____

Title_____

Witness_____

Business Address_____

_____

Telephone_____

Section 00410

Bid Bond

STATE OF _____

COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS, that we, _____, as Principal, and _____, as Surety, we held and firmly bound unto _____ in the sum of _____ dollars ($_____) lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, personal representatives, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted to the Owner a Bid for construction of the _____.

NOW THEREFORE, the conditions of this obligation are such that if the Bid be accepted, the Principal shall, within ten (10) days after receipt of conformed Contract Documents, execute a Contract in accordance with the Bid upon the terms, conditions and prices set forth therein, and in the form and manner required by the Contract Documents and execute sufficient and satisfactory separate Performance and Payment Bonds payable to the Owner, totaling and aggregate amount of 210 percent of the total Contract Price, in form satisfactory to the Owner, then this obligation shall be void; otherwise, it shall be and remain in full force and effect in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Owner, upon demand the amount hereof in good and lawful money of the United Sates of America, not as a penalty, but as liquidated damages.

This bond is given pursuant to and in accordance with O.C.G.A. §36-91-1 et.seq. and all the provisions of the law referring to this character of bond as set forth in said Sections or as may be hereinafter enacted and these are hereby made a part hereof to the same extent as if set out herein in full.

IN WITNESS WHEREOF, the said Principal has hereunder affixed its signature and seal, and said Surety has hereunto caused to be affixed its corporate signature and seal, by its duly authorized officers, of this _____ day of _____, 20__.

Bid Bond

CONTRACTOR – PRINCIPAL: _____

By: _____
(name signed)

_____
(name printed or typed)

Title: _____

Address: _____

_____

Attest: _____
(name signed)

_____
(name printed or typed)

Title: _____
(SEAL)

SURETY: _____

By: _____
(name signed)

_____
(name printed or typed)

Title: _____

Address: _____

_____

Attest: _____
(name signed)

_____
(name printed or typed)

Title: _____
(SEAL)

Note: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

SAMPLE PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That whereas, Public Utility District No. 1 of Okanogan County, Washington, a municipal corporation, hereinafter designated as the "District", has entered into an agreement dated _____, 200___, with, _____ _____ hereinafter designated as the "Contractor", providing for _____ _____ which agreement is on file at the District's office and by this reference is made a part hereof.

NOW, THEREFORE, We, the undersigned Contractor, as principal, and _____ _____ a corporation organized and existing under and by virtue of the laws of the State of _____ and duly authorized to do a surety business in the State of Washington, as surety, are held and firmly bound into the State of Washington and the District in the sum of _____ DOLLARS ($_____) for the payment of which we do jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns by these presents.

THE CONDITIONS OF THIS OBLIGATION are such that if the said principal, his heirs, representatives or successors, shall well and truly keep and observe all of the covenants, conditions, and agreements in said contract and shall faithfully perform all of the provisions of the contract, pay all taxes of the Contractor arising therefrom, and pay all laborers, mechanics, subcontractors, and materiel men and all persons who shall supply such person or subcontractors with provisions and supplies for carrying on such work, and shall indemnify and save harmless the District, their officers, and agents, from any and all claims, actions or damage of every kind and description including attorneys' fees and legal expense and from any pecuniary loss resulting from the breach of any said terms, covenants, or conditions to be performed by the Contractor:

AND FURTHER, that the Contractor will correct or replace any defective work or materials discovered by the said District within a period of one year from the date of acceptance of such work or material by said District, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

No change, extension of time, alteration or addition to the work to be performed under the agreement shall in any affect Contractor's or surety's obligation on this bond, and surety does hereby waive notice of any change, extension of time, alterations or additions thereunder.

This bond is furnished in pursuance of the requirements of Sections 54.04.080 et seq. of Revised Code of Washington, and, in addition to other Contractor and surety to the District for the use and benefit of said District together with all laborers, mechanics, subcontractors, material men, and all persons who supply such person or subcontractors with provisions and supplies for the carrying on of the work covered by the agreement to the extend required by said Revised Code of Washington.

IN WITNESS WHEREOF, the said Contractor and the said surety have caused this bond to be signed and sealed by their duly authorized officers this _____ day of _____, 200___.

_____
Surety

_____
Title

_____
Contractor

_____
Title

SURETY BOND – SAMPLE FORM

BOND ISSUING COMPANY:

BOND NUMBER:

We,

NAME, INCLUDING TRADE NAME, OF HEALTH CLUB

ADDRESS, INCLUDING LOCATION OF HEALTH CLUB

as principal, and

SURETY COMPANY

ADDRESS

as surety authorized to do business in the Commonwealth of Pennsylvania, are held and firmly bound to the Commonwealth of Pennsylvania and to buyers of health club contracts who sustain any loss or damage as a result of the breach of contract or bankruptcy of the above health club. This bond has been undertaken by the principal in the amount of _____ ($) for the payment of which we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally.

PURPOSE AND PROTECTION AFFORDED

This bond is issued pursuant to §11 of the Health Club Act, Act of December 21, 1989, P.L. 672, 73 P.S. 2171, for the exclusive purpose of providing refunds to buyers of health club contracts shall not be deemed an asset of the health club for bankruptcy or any other purpose.

BUYER RECOVERY

In the event the principal declares bankruptcy, or the principal breaches the terms of a health club contract or the requirements for health club contracts as specified by §3 of the Health Club Act, and after giving written notice of a claim to the principal, the injured buyer has not received a refund from the principal within thirty (30) days of said notice, then the buyer may file a claim with the surety. If the claim is not paid within forty-five

(45) days, the buyer may bring an action based on this bond and recover against the surety.

STATUTE OF LIMITATIONS

Any claim under this bond shall be filed no later than six (6) months from the date on which the injury occurred.

LIMITATION ON LIABILITY OF SURETY

The aggregate liability of this bond to all persons for all breaches of the conditions of the bond shall in no event exceed the amount of this bond. If claims filed exceed the amount of this bond, the surety shall distribute the amount of the bond as a standard percentage of the amount claimed by all buyers seeking relief under this bond.

DURATION OF BOND

This bond may be canceled by the surety at any time upon giving ninety (90) days written notice to the principal and the Director of the Pennsylvania Bureau of Consumer Protection. Notice must be given by registered mail or certified mail-return receipt requested. Cancellation of this bond shall not release the surety from liability under health club contracts entered into during the time period when this bond was in effect, and this bond shall remain in effect with regard to all such contracts until their date of expiration.

Signed, sealed and dated the _____day of _____, 200_.

(Seal) **SEAL OF SURETY**

Principal	Surety
BY: _____	BY: _____

INSTRUCTIONS FOR LIST OF DBE PARTICIPANTS

If a DBE Goal is indicated, you must propose to achieve a goal that is equal or greater then the percentage required. If no goal is indicated, you may propose your own goal.

The DBE firms to be utilized as counting toward the proposed goal must be listed on this form, along with their addresses, type of work and the amount to be paid to each of the minority firms. The amount entered will not necessarily be the contract amount, but must be the actual amount that will be paid to the DBE firm. In the case of a DBE supplier, the amount paid and 60% of that amount both will be entered; and only the 60% figure should be added to the total. An example of this is shown in the example chart:

Vendor Number	Company Name And Address (City and State)	Type Of Work	*Work Code	Race Neutral	Race Conscious	Amount
	ABC Oil Company Atlanta, GA	Diesel Fuel Supplier				$80.000.00 (60%= $48,000.00)

* For Departmental use ONLY. Do not fill in Work Codes.

The Contractor shall indicate for each DBE and Type of Work whether the DBE Participant is Race Neutral or Race Conscious by placing a checkmark in the appropriate column.

PLEASE NOTE: For 60% of the amount paid to a DBE supplier to be eligible to count toward fulfilling the DBE goal, the supplier must be an established “regular dealer’ in the product involved, and not just a broker. A “regular dealer” would normally sell the product to several customers and would usually have product inventory on hand.

DBE GOALS

VENDOR ID: BIDDER'S COMPANY NAME:

PROJECT NO. NRT-09(7)
COUNTY: Gilmer County
LET NO: LET DATE: TOTAL BID:

THE REQUIRED DBE GOAL ON THIS CONTRACT IS: 10%

I PROPOSE TO UTILIZE THE FOLLOWING DBE CONTRACTORS:

LIST OF DBE PARTICIPANTS

VENDOR NUMBER	**DBE NAME/ ADDRESS (CITY, STATE)**	**TYPE OF WORK**	***WORK** *CODE*	**Race Neutral**	**Race Conscious**	*AMOUNT*
			TOTAL			

***For Departmental use only. Do not fill in Work codes.**

PLEASE NOTE: Only 60 % of the participation of a DBE Supplier who does not manufacture or install the product will be counted toward the goal. See below for further instructions.

City of Ellijay
Cost Estimate for Harrison Park Trails Project
October 2011
NOTE: Quantities are approximate. Bidders are responsible for their own take-offs.

	Item	*Unit*	*Quantity*	*Unit Price*
Trail (1.15 miles)				
	Site Work			
	Temporary Erosion Control, Type C Silt Fencing	LF		
	Clearing & Grubbing	LS		
	Grading to Improve Drainage	LS		
	Scraping Sod	SY		
	Compacting Sub-base	SY		
	Excavation of topsoil (18" depth) *for Concrete ONLY*	CY		
A	***Installation – Envirogrid, EGA 20***			
	Non-woven Geotextile Fabric	SF		
	Envirogrid, 6" ht. X 8' w. roll	SF		
	J-Hooks, 18" L, #3 Rebar, 5' o.c.	EA		
	Backfill w/ #57 Stone (6" depth)	CY		
	Topdress w/ #89 Stone (1-2" depth)	CY		
B	***Installation – Conventional Asphalt, 8' wide***			
	6-8" Compacted Aggregate Base	CY		
	2-3" Binder Course	SY		
	1-1.5" Surface Coat/Topping	SY		
C	***Installation – Rubberized Asphalt, 8' wide***			
	6-8" Compacted Aggregate Base	CY		
	2-3" Binder Course	SY		
	1-1.5" Surface Coat/Topping, w/ Recycled Rubber	SY		
D	***Installation – Recycled Rubber Mat Paving, 8' wide***			
	6-8" Compacted Aggregate Base	CY		
	Non-woven Geotextile Fabric	SF		
	3" Crusher Run	CY		
	1.5" Pour-in-Place Rubber Trail Surface	SF		
E	***Installation – Reinforced Concrete Paving, 8' wide***			
	12" Compacted Aggregate Base, #3 stone	CY		
	6-8" Compacted Aggregate Base, #57 stone	CY		
	6" Reinforced Concrete	CY		

City of Ellijay
Cost Estimate for Harrison Park Trails Project
October 2011
NOTE: Quantities are approximate. Bidders are responsible for their own take-offs.

	Item	*Unit*	*Quantity*	*Unit Price*
	ADD ALTERNATE 1:			
Parking Area & Access Road Construction (2450 SY)				
	Site Work			
	Temporary Erosion Control, Type C Silt Fencing	LF		
	Clearing & Grubbing	LS		
	Grading to Improve Drainage	LS		
	Scraping Sod	SY		
	Compacting Sub-base	SY		
	Excavation of topsoil (18" depth) *for Concrete ONLY*	CY		
A	***Installation – Envirogrid, EGA 20***			
	Non-woven Geotextile Fabric	SF		
	Envirogrid, 6" ht. X 8' w. roll	SF		
	J-Hooks, 18" L, #3 Rebar, 5' o.c.	EA		
	Backfill w/ #57 Stone (6" depth)	CY		
	Topdress w/ #89 Stone (2" depth)	CY		
B	***Installation – Conventional Asphalt***			
	6-8" Compacted Aggregate Base	CY		
	2-3" Binder Course	SY		
	1-1.5" Surface Coat/Topping	SY		
	Striping Paint (40 P.S.)	LF		
C	***Installation – Rubberized Asphalt***			
	6-8" Compacted Aggregate Base	CY		
	2-3" Binder Course	SY		
	1-1.5" Surface Coat/Topping, w/ Recycled Rubber	SY		
	Striping Paint (40 P.S.)	LF		
D	***Installation – Recycled Rubber & Stone Paving***			
	6-8" Compacted Aggregate Base	CY		
	Non-woven Geotextile Fabric	SF		
	4" Crusher Run	CY		
	2" Pour-in-Place Rubber Pavement Surface	SF		
E	***Installation – Reinforced Concrete Paving***			
	12" Compacted Aggregate Base, #3 stone	CY		
	6-8" Compacted Aggregate Base, #57 stone	CY		
	6" Reinforced Concrete	CY		
	Striping Paint (40 P.S.)	LF		

City of Ellijay
Cost Estimate for Harrison Park Trails Project
October 2011
NOTE: Quantities are approximate. Bidders are responsible for their own take-offs.

	Item	*Unit*	*Quantity*	*Unit Price*
	ADD ALTERNATE 2:			
Boat Launch Area Construction (165 SY)				
	Site Work			
	Clearing & Grubbing	LS		
	Temporary Erosion Control, Type C Silt Fencing	LF		
	Grading to Improve Drainage	LS		
	Scraping Sod	SY		
	Compacting Sub-base	SY		
A	***Installation – Envirogrid, EGA 20***			
	Non-woven Geotextile Fabric	SF		
	Envirogrid, 6” ht. X 8' w. roll	SF		
	J-Hooks, 18” L, #3 Rebar, 5' o.c.	EA		
	Backfill w/ #57 Stone (6” depth)	CY		
	Topdress w/ #89 Stone (2” depth)	CY		

CONTRACTS

NOT INCLUDED IN BID PACKAGE:

Standard Form of Agreement (AIA Contract)	6 pages
General Conditions A201	40 pages

NOTE:

These documents are available for review on-line at www.aia.org and will be executed once the contract has been awarded.

The Applicant shall incorporate, or cause to be incorporated, into all construction contracts **exceeding $10,000** the following **Equal Employment Opportunity** clauses:

"During the performance of this contract, the contractor agrees as follows:

"(1) The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, or handicapping condition. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, national origin, or handicapping condition. Such action shall include but not be limited to, the following: Employment, upgrading; demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provision of this nondiscrimination clause.

"(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin, or handicapping condition.

"(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or workers' representative of the contractor's commitments under **Section 202 of Executive Order 11246, as amended (3 CFR 169 (1979)),** and shall post copies of notices in conspicuous places available to employees and applicants for employment.

"(4) The contractor will comply with all provisions of **Executive Order 11246,** as amended, and the rules, regulations, and relevant orders of the Secretary of Labor.

"(5) The contractor will furnish all information and reports required by **Executive Order 11246**, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of

investigation to ascertain compliance with such rules, regulations and orders.

"(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in **Executive Order 11246,** as amended, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246, as amended, or by rules, regulations, or orders of the Secretary of Labor, or as otherwise provided by law.

"(7) The contractor will include the provisions of **Paragraphs (1) through (7)** in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to **Section 204 of Executive Order 11246,** as amended, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the contracting agency may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States."

SPECIAL PROVISIONS

November 2, 2007
December 14, 2007
Revision Date: May 12, 2008
First Use Date: August 22, 2008

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Section 171—Silt Fence

Delete Section 171 and substitute the following:

171.1 General Description

This work includes furnishing, installing, and removing a water permeable filter fabric fence to remove suspended particles from drainage water.

171.1.01 Definitions

General Provisions 101 through 150.

171.1.02 Related References

A. Standard Specifications

Section 163—Miscellaneous Erosion Control Items

Section 700—Grassing

Section 862—Wood Posts and Bracing

Section 881—Fabrics

Section 894—Fencing

B. Referenced Documents

ASTM D 3786

ASTM D 4355

ASTM D 4632

ASTM D 4751

GDT 87

QPL 36

171.1.03 Submittals

General Provisions 101 through 150.

171.2 Materials

Materials shall meet the requirements of the following Specifications:

Material	Section
Filter Fabrics	881

Fencing	894
Wood Posts and Bracing	862

Conditions during Project construction will affect the quantity of the silt fence to be installed.

The Engineer may increase, decrease, or eliminate the quantity at his or her direction. Variations in quantity are not changes in details of construction or in the character of the work.

For Type A, B, and C fences, use fabric as specified in Subsection 881.2.07, "Silt Fence Filter Fabric."

171.2.01 Delivery, Storage, and Handling

During shipment and storage, wrap the fabric in a heavy-duty covering that will protect the cloth from sunlight, mud, dust, dirt, and debris. Do not expose the fabric to temperatures greater than 140 °F (60 °C).

When installed, the Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

171.3 Construction Requirements

171.3.01 Personnel

General Provisions 101 through 150.

171.3.02 Equipment

General Provisions 101 through 150.

171.3.03 Preparation

General Provisions 101 through 150.

171.3.04 Fabrication

General Provisions 101 through 150.

171.3.05 Construction

Install the silt fence according to this Specification, as shown on the Plans, or as directed by the Engineer as; perimeter, ditch check or similar protection.

A. Install Silt Fence

Install silt fence by either of the following methods:

1. Excavated Trench Method
    a. Excavate a trench 4 to 6 in (100 to 150 mm) deep using equipment such as a trenching machine or motor grader. If equipment cannot be operated on the site, excavate the trench by hand.
2. Soil Slicing Method
    a. Create a mechanical slice in the soil 8 to 12 in (200 to 300 mm) deep to receive the silt fence. Ensure that the width of the slice is not more than 3 in (75 mm). Mechanically insert the silt fence fabric into the slice in a simultaneous operation with the slicing that ensures consistent depth and placement.

Install the first post at the center of the low point (if applicable). Space the remaining posts a maximum of 6 ft (1.8 m) apart for Types A and B fence and 4 ft (1.2 m) apart for Type C fence.

Bury the posts at least 18 in (450 mm) into the ground. If this depth cannot be attained, secure the posts enough to prevent the fence from overturning from sediment loading.

Attach the filter fabric to the post using wire, cord, staples, nails, pockets, or other acceptable means.

a. Staples and Nails (Wood Posts): Evenly space staples or nails with at least five per post for Type A fence and four per post for Type B fence.
b. Pockets: If using pockets and they are not closed at the top, attach the fabric to a wood post using at least one additional staple or nail, or to a steel post using wire. Ensure that the additional attachment is within the top 6 in (150 mm) of the fabric.

Install the filter fabric so that 6 to 8 in (150 to 200 mm) of fabric is left at the bottom to be buried. Provide a minimum overlap of 18 in (450 mm) at all splice joints.

For Type C fence:

1. Woven Wire Supported
   a. Steel Post: Use wire to attach the fabric to the top of the woven wire support fence at the midpoint between posts. Also, use wire to attach the fabric to the post.
2. Polypropylene Mesh Supported
   a. Wood Post: Use at least six staples per post. Use two staples in a crisscross or parallel pattern to secure the top portion of the fence. Evenly space the remaining staples down the post.
   b. Steel Post: Use wire to attach the fabric and polypropylene mesh to the post.

Install the fabric in the trench so that 4 to 6 in (100 to 150 mm) of fabric is against the side of the trench with 2 to 4 in (50 to 100 mm) of fabric across the bottom in the upstream direction.

Backfill and compact the trench to ensure that flow cannot pass under the barrier. When the slice method is used, compact the soil disturbed by the slice on the upstream side of the silt fence first, and then compact the downstream side.

When installing a silt fence across a waterway that produces significant runoff, place a settling basin in front of the fence to handle the sediment load, if required. Construct a suitable sump hole or storage area according to Section 163.

B. Install silt fence ditch checks

Temporary Silt Fence Ditch Checks

Temporary silt fence ditch checks shall be constructed of the material type selected and shown on the approved erosion and sediment control plan. Item installation shall be constructed and placed according to approved Plan details. Temporary ditch checks shall remain in place until the permanent ditch protection is in place or being installed and the removal is approved by the Engineer.

C. Remove the Silt Fence

Keep all silt fence in place unless or until the Engineer directs it to be removed. A removed silt fence may be used at other locations if the Engineer approves of its condition.

After removing the silt fence, dress-the area to natural ground, grass-and mulch the area according to Section 700.

The silt fence shall remain until the Project is accepted or until the fence is removed. Also, remove and dispose of the silt accumulations at the silt fence.

Remove and replace any deteriorated filter fabric that reduces the effectiveness of the silt fence.

Repair or replace any undermined silt fence at no additional cost to the Department.

171.3.06 Quality Acceptance

Approved silt fence is listed in QPL 36. Approved fabrics must consistently exceed the minimum requirements of this Specification as verified by the Office of Materials and Research. The Office of Materials and Research will remove fabric that fails to meet the minimum requirements of this specification from the QPL until the products' acceptability has been reestablished to the Department's satisfaction.

At the time of installation, the Engineer will reject the fabric if it has defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

171.3.07 Contractor Warranty

The silt fence shall remain until the Project is accepted or until the fence is removed. Also, remove and dispose of the silt accumulations at the silt fence.

Remove and replace any deteriorated filter fabric that reduces the effectiveness of the silt fence.

Repair or replace any undermined silt fence at no additional cost to the Department.

171.4 Measurement

The quantity of silt fence, silt fence ditch checks to be paid for is the actual number of linear feet (meters) of silt fence, measured in place from end post to end post of each separate installation. The silt fence must be complete and accepted.

171.4.01 Limits

General Provisions 101 through 150.

171.5 Payment

Silt fence Type A, B, or C measured as defined in Subsection 171.4, "Measurement," is paid for at the Contract Unit Price bid per linear foot (meter).

Payment is full compensation for the following:

Furnishing materials

Erecting the fence

Dressing and grassing, when required

Removing the fence, when required

Payment for this Item is made as follows:

Seventy-five percent of the Contract Price bid per linear foot (meter) is paid when each fence is complete in place.

Twenty-five percent is paid at removal or acceptance.

If the silt fence must be repaired or removed, as the result of neglect or damage, perform the work at no additional cost to the Department.

Payment will be made under:

Item No. 171	Silt fence, type__	Per linear foot (meter)

171.5.01 Adjustments

General Provisions 101 through 150.

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Temporary erosion- and sedimentation-control measures.

B. Related Sections:

1. Section 015000 "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities[**,** and temporary erosion- and sedimentation-control measures].
2. Section 017300 "Execution" for field engineering and surveying.

1.3 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and [defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated].

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at [Ellijay City Hall and/or Project site].

1.7 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises[where indicated].

D. Utility Locator Service: Notify [utility locator service] [Call Before You Dig] for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion- and sedimentation-control[and plant-protection] measures are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

I. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain[or to be relocated]. [Flag] [Wrap a 1-inch (25-mm) blue vinyl tie tape flag around] each tree trunk at 54 inches (1372 mm) above the ground.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. General: Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove roots, obstructions, and debris to a depth of [18 inches (450 mm)] below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.
4. Chip removed tree branches and [stockpile in areas approved by Architect].

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil [to depth of 2 inches (50 mm)] in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.6 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and stockpile on site at Owner's direction.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Preparing subgrades for [pavement systems].
2. Subbase course[and base course] for concrete, asphalt or rubber mat paving.

B. Related Sections:

1. Section 311000 "Site Clearing" for site stripping, grubbing, stripping[and stockpiling] topsoil.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional

excavation and replacement material will be paid for according to Contract provisions for [unit prices] .

2. Bulk Excavation: Excavation more than [10 feet (3 m)] in width and more than [30 feet (9 m)] in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed [1 cu. yd. (0.76 cu. m)] for bulk excavation or [3/4 cu. yd. (0.57 cu. m)] for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket; measured according to SAE J-732.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material [3/4 cu. yd. (0.57 cu. m)] or more in volume that exceed a standard penetration resistance of [100 blows/2 inches (97 blows/50 mm)]when tested by a geotechnical testing agency, according to ASTM D 1586.

J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

1.4 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
2. Controlled low-strength material, including design mixture.

B. Samples for Verification: For the following products, in sizes indicated below:
1. Geotextile: 12 by 12 inches (300 by 300 mm).

C. Qualification Data: For qualified testing agency.

D. Material Test Reports: For each [on-site] [and] [borrow] soil material proposed for fill and backfill as follows:
1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to [ASTM D 698] [ASTM D 1557].

E. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

B. Preexcavation Conference: Conduct conference at [Project site].

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify [utility locator service] ["Call Before You Dig"] for area where Project is located before beginning earth moving operations.

D. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in [Section 311000 "Site Clearing,"] are in place.

E. Do not commence earth moving operations until plant-protection measures are in place.

F. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

G. Do not direct vehicle or equipment exhaust towards protection zones.

H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification [Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487] [Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145], or a combination of these groups; free of rock or gravel larger than [3 inches (75 mm)] in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. Liquid Limit: NP.
2. Plasticity Index: NP.

C. Unsatisfactory Soils: Soil Classification [Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487] [Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145], or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

H. Drainage Course: Narrowly graded mixture of [washed]crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

J. Sand: ASTM C 33; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 157 lbf (700 N); ASTM D 4632.
3. Sewn Seam Strength: 142 lbf (630 N); ASTM D 4632.
4. Tear Strength: 56 lbf (250 N); ASTM D 4533.
5. Puncture Strength: 56 lbf (250 N); ASTM D 4833.
6. Apparent Opening Size: [No. 60 (0.250-mm)] sieve, maximum; ASTM D 4751.
7. Permittivity: [0.2] per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 247 lbf (1100 N); ASTM D 4632.
3. Sewn Seam Strength: 222 lbf (990 N); ASTM D 4632.
4. Tear Strength: 90 lbf (400 N); ASTM D 4533.
5. Puncture Strength: 90 lbf (400 N); ASTM D 4833.
6. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. [24 inches (600 mm)] outside of concrete forms other than at footings.
b. [6 inches (150 mm)] outside of minimum required dimensions of concrete cast against grade.
c. [18 inches (450 mm)] beneath bottom of concrete slabs-on-grade.
d. [6 inches (150 mm)] beneath pipe in trenches, and the greater of [24 inches (600 mm)] wider than pipe or [42 inches (1065 mm)] wide.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:

a. [24 inches (600 mm)] outside of concrete forms other than at footings.
b. [6 inches (150 mm)] outside of minimum required dimensions of concrete cast against grade.
c. [18 inches (450 mm)] beneath bottom of concrete slabs-on-grade.

d. [6 inches (150 mm)] beneath pipe in trenches, and the greater of [24 inches (600 mm)] wider than pipe or [42 inches (1065 mm)] wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade [below pavements] with a pneumatic-tired [and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes)] to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction[, repeating proof-rolling in direction perpendicular to first direction]. Limit vehicle speed to 3 mph (5 km/h).
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for [unit prices].

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Removing trash and debris.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under pavements, use satisfactory soil material.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than [8 inches (200 mm)] in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to [ASTM D 698] [ASTM D 1557]:

1. Under pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at [95] percent.

2. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at [85] percent.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus [1 inch (25 mm)] .
2. Pavements: Plus or minus [1/2 inch (13 mm)] .

3.14 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Section 334600 "Subdrainage."

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch (150-mm) course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches (300 mm) of filter material, placed in compacted layers 6 inches (150 mm) thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each filter material layer [to 85 percent of maximum dry unit weight according to ASTM D 698] [with a minimum of two passes of a plate-type vibratory compactor].

C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade, in compacted layers 6 inches (150 mm) thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each filter material layer [to 85 percent of maximum dry unit weight according to ASTM D 698] [with a minimum of two passes of a plate-type vibratory compactor].
2. Place and compact impervious fill over drainage backfill in 6-inch- (150-mm-) thick compacted layers to final subgrade.

3.15 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course[and base course] on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course[and base course] under pavements and walks as follows:
   1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
   2. Place base course material over subbase course under hot-mix asphalt pavement.
   3. Shape subbase course[and base course] to required crown elevations and cross-slope grades.
   4. Place subbase course[and base course] 6 inches (150 mm) or less in compacted thickness in a single layer.
   5. Place subbase course[and base course] that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
   6. Compact subbase course[and base course] at optimum moisture content to required grades, lines, cross sections, and thickness to not less than [95] percent of maximum dry unit weight according to [ASTM D 698] [ASTM D 1557].

C. Pavement Shoulders: Place shoulders along edges of subbase course[and base course] to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase[and base] layer to not less than [95] percent of maximum dry unit weight according to [ASTM D 698] [ASTM D 1557].

3.16 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

   1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
   2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
   3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
   4. Compact each layer of drainage course to required cross sections and thicknesses to not less than [95] percent of maximum dry unit weight according to ASTM D 698.

3.17 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

   1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
   2. Determine that fill material and maximum lift thickness comply with requirements.
   3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every [2000 sq. ft. (186 sq. m)] or less of paved area or building slab, but in no case fewer than three tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

.Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

.Section Includes:

1. Hot-mix asphalt paving. *(rubberized asphalt paving)*

.Related Sections:

1. Section 312000 "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.

1.3 UNIT PRICES

.Work of this Section is affected by [unit prices quoted in cost estimate].

1.4 DEFINITION

.Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.5 ACTION SUBMITTALS

.Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
2. Job-Mix Designs: For each job mix proposed for the Work.

.Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

.Samples: For each paving fabric, 12 by 12 inches (300 by 300 mm) minimum.

.Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:

1. Each paving fabric, 12 by 12 inches (300 by 300 mm) minimum.

1.6 INFORMATIONAL SUBMITTALS

.Qualification Data: For qualified [manufacturer] [and] [Installer].

.Material Certificates: For each paving material, from manufacturer.

.Material Test Reports: For each paving material.

1.7 QUALITY ASSURANCE

.Manufacturer Qualifications: [A paving-mix manufacturer registered with and approved by authorities having jurisdiction or by GDOT].

.Installer Qualifications: Imprinted-asphalt manufacturer's authorized installer who is trained and approved for installation of imprinted asphalt required for this Project.

.Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

.Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of GDOT standards for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

.Preinstallation Conference: Conduct conference at [Project site].

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

    a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
    b. Review condition of subgrade and preparatory work.
    c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
    d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.8 DELIVERY, STORAGE, AND HANDLING

.Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

.Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.9 PROJECT CONDITIONS

.Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
4. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

.Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of [40 deg F (4.4 deg C) for oil-based materials] [55 deg F (12.8 deg C) for water-based materials], and not exceeding 95 deg F (35 deg C).

PART 2 - PRODUCTS

2.1 AGGREGATES

.General: Use materials and gradations that have performed satisfactorily in previous installations.

.Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

.Fine Aggregate: [ASTM D 1073] [or] [AASHTO M 29], sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

.Mineral Filler: [ASTM D 242] [or] [AASHTO M 17], rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

.Asphalt Binder: AASHTO M 320 or AASHTO MP 1a, [PG 76-22]. (*with 10% ground tire rubber by weight of binder)*

.Asphalt Cement: [ASTM D 3381 for viscosity-graded material] and [ASTM D 946 for penetration-graded material].

.Prime Coat: ASTM D 2027, medium-curing cutback asphalt, [MC-30 or MC-70] [MC-250].

.Prime Coat: Asphalt emulsion prime coat complying with GDOT requirements.

.Tack Coat: [ASTM D 977] [or] [AASHTO M 140] emulsified asphalt, or [ASTM D 2397] [or] [AASHTO M 208] cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

.Fog Seal: [ASTM D 977] [or] [AASHTO M 140] emulsified asphalt, or [ASTM D 2397] [or] [AASHTO M 208] cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.

.Water: Potable.

.Undersealing Asphalt: ASTM D 3141, pumping consistency.

2.3 AUXILIARY MATERIALS

.Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

.Sand: [ASTM D 1073] [or] [AASHTO M 29], Grade Nos. 2 or 3.

.Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

.Joint Sealant: [ASTM D 6690] [or] [AASHTO M 324], [Type I] [Type II or III] [Type IV],

2.4 MIXES

.Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction [; designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types";] and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Base Course: GDOT Graded Aggregate Base.
3. Surface Course: 9.5 mm, Superpave, Recycled Asphaltic Concrete, GP2.

.Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes[approved by authorities having jurisdiction and] designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types."

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Provide mixes complying with composition, grading, and tolerance requirements in ASTM D 3515 for the following nominal, maximum aggregate sizes:

    a. Base Course: [1 inch (25 mm)] .
    b. Surface Course: [1/2 inch (13 mm)] .

.Emulsified-Asphalt Slurry: ASTM D 3910, [Type 1] [Type 2] [Type 3].

PART 3 - EXECUTION

3.1 EXAMINATION

.Verify that subgrade is dry and in suitable condition to begin paving.

.Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, [repeating proof-rolling in direction perpendicular to first direction]. Limit vehicle speed to 3 mph (5 km/h).
2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

.Proceed with paving only after unsatisfactory conditions have been corrected.

.Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

3.2 SURFACE PREPARATION

.General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

.Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

.Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. (0.7 to 2.3 L/sq. m). Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

3.3 PAVING GEOTEXTILE INSTALLATION

.Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches (100 mm) and transverse joints 6 inches (150 mm).

1. Protect paving geotextile from traffic and other damage and place hot-mix asphalt paving overlay the same day.

3.4 HOT-MIX ASPHALT PLACING

.Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 250 deg F (121 deg C).
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

.Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

.Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.5 JOINTS

.Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints [using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."]
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.6 COMPACTION

.General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

.Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

.Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to [ASTM D 6927] [or] [AASHTO T 245], but not less than 94 percent nor greater than 100 percent.
2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

.Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

.Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

.Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

.Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

.Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

.Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch (13 mm).
2. Surface Course: Plus 1/4 inch (6 mm), no minus.

.Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:

1. Base Course: [1/4 inch (6 mm)] .
2. Surface Course: [1/8 inch (3 mm)] .
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

3.8 FIELD QUALITY CONTROL

.Testing Agency: [Owner will engage] a qualified testing agency to perform tests and inspections.

.Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

.Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

.In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to [ASTM D 979] [or] [AASHTO T 168].

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than 3 cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

.Replace and compact hot-mix asphalt where core tests were taken.

.Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 DISPOSAL

.Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION 321216

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Driveways.
2. Roadways.
3. Parking lots.
4. Walks/Trails

B. Related Sections:

1. [Section 033000 "Cast-in-Place Concrete"] for general building applications of concrete.

2. Section 321373 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified [ready-mix concrete manufacturer] [and] [testing agency].

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates. [Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.]

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

C. Concrete Testing Service: Engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

D. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.
2. Build mockups of concrete paving in the location and of the size indicated or, if not indicated, build mockups where directed by Architect and not less than [96 inches (2400 mm) by 96 inches (2400 mm)].
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at [Project site] .

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

    a. Concrete mixture design.
    b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

    a. Contractor's superintendent.
    b. Independent testing agency responsible for concrete design mixtures.
    c. Ready-mix concrete manufacturer.
    d. Concrete paving subcontractor.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet (30.5 m) or less.[Do not use notched and bent forms.]

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [25] percent.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from [galvanized-]steel wire into flat sheets.

C. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

D. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

E. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars; assembled with clips.

F. Plain-Steel Wire: ASTM A 82/A 82M, [galvanized].

G. Deformed-Steel Wire: ASTM A 496/A 496M.

H. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars[; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating]. Cut bars true to length with ends square and free of burrs.

I. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

J. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

K. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, [gray] portland cement [Type I] .[Supplement with the following:]

a. Fly Ash: ASTM C 618, [Class C] [or] [Class F].
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, [Class 1N], uniformly graded. Provide aggregates from a single source[with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials].

1. Maximum Coarse-Aggregate Size: [1 inch (25 mm)] nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

2.4 RELATED MATERIALS

A. Joint Fillers: [ASTM D 1751, asphalt-saturated cellulosic fiber] [or] [ASTM D 1752, cork or self-expanding cork] in preformed strips.

2.5 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): [4000 psi (27.6 MPa)] .
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: [0.50] .
3. Slump Limit: [5 inches (125 mm)] plus or minus 1 inch (25 mm).

C. Limit water-soluble, chloride-ion content in hardened concrete to [0.15] percent by weight of cement.

D. Cementitious Materials:[Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.][Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:]

1. Fly Ash or Pozzolan: 25 percent.
2. Ground Granulated Blast-Furnace Slag: 50 percent.
3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

2.6 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M[and ASTM C 1116/C 1116M]. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete batches of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete batches larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below [concrete paving] to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction[and repeat in perpendicular direction]. Limit vehicle speed to 3 mph (5 km/h).
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of [1/2 inch (13 mm)] according to requirements in Section 312000 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use [bonding agent] [epoxy bonding adhesive] at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
5. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a [3/8-inch (10-mm)] radius. Repeat grooving of contraction joints after applying surface finishes.[Eliminate grooving-tool marks on concrete surfaces.]

a. Tolerance: Ensure that grooved joints are within [3 inches (75 mm)] either way from centers of dowels.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

a. Tolerance: Ensure that sawed joints are within [3 inches (75 mm)] either way from centers of dowels.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a [3/8-inch (10-mm)] radius. Repeat tooling of edges after applying surface finishes.[Eliminate edging-tool marks on concrete surfaces.]

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation[, steel reinforcement,] and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface[and steel reinforcement] before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 (ACI 301M) by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies[, reinforcement,] or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating [reinforcement] [dowels] [and] joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. [Chamfer] exterior corners and edges of permanently exposed concrete.

K. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture

temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.

2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

L. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms[, steel reinforcement,] and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by [moisture curing] [moisture-retaining-cover curing] [curing compound] [or] [a combination of these] as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch (19 mm).
2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/2 inch (13 mm).
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches (13 mm per 300 mm) of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).
6. Vertical Alignment of Dowels: 1/4 inch (6 mm).
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches (6 mm per 300 mm) of dowel.
8. Joint Spacing: 3 inches (75 mm).
9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: [Engage] a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each [100 cu. yd. (76 cu. m)] [5000 sq. ft. (465 sq. m)] or fraction thereof of each concrete mixture placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321816.13 – RUBBER PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Unitary synthetic [poured] rubber seamless surface.

B. Related Sections:

1. Section 312000 "Earth Moving" for filling and grading and for [drainage course] [drainage/separation geotextiles] [and subbase courses].

1.3 DEFINITIONS

A. SBR: Styrene-butadiene rubber.

1.4 PERFORMANCE REQUIREMENTS

A. Accessibility of Surface Systems: According to ASTM F 1951.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

C. Shop Drawings: include materials, plans, cross sections, drainage, installation, and edge termination.

D. Samples for Initial Selection:

1. Include similar Samples of paving system involving color selection.

E. Samples for Verification: For each type of paving surface system indicated.

1. Minimum 6-by-6-inch (150-by-150-mm) Sample of [synthetic rubber seamless] surface.
2. 6-inch (150-mm) long by full-size cross section of border edging.
3. Minimum 12-by-12-inch (300-by-300-mm) Sample of geosynthetic fabric.
4. Minimum 6-by-6-inch (150-by-150-mm) Sample of geosynthetic, molded-sheet drainage panel.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

1. Extent of paving surface systems.

B. Qualification Data: For qualified [Installer] [and] [testing agency].

C. Product Certificates: For each type of paving surface system, from manufacturer.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for paving surface system.

E. Field quality-control reports.

F. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For paving surface system to include in maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Termination Edge Units: [3] full-size units.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain paving surface system materials[, including primers and binders,] from single source from single manufacturer.

1. Provide secondary materials [including adhesives, primers,] [geosynthetics,] and repair materials of type and from source recommended by manufacturer of paving surface system materials.

1.10 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit paving surface system installation to be performed according to manufacturers' written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of paving surface system that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of surface and other materials beyond normal weathering.
b. Inconsistency of thickness.
c. Improper grading of material.

2. Warranty Period: [**10**] years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 UNITARY SYNTHETIC SEAMLESS SURFACE

A. Surface System: Poured-in-place, single-layer system. Provide manufacturer's standard thickness as required for overall thickness indicated, tested for impact attenuation according to ASTM F 1292[and for accessibility according to ASTM F 1951].

1. Products: Subject to compliance with requirements.

2. Cushion Course: Manufacturer's standard blend of[recycled] SBR[and EPDM] rubber, particles forming an integral wearing course and cushion course, site mixed and applied.
3. Binder: Weather-resistant, UV-stabilized, flexible, nonhardening, 100 percent solids polyurethane complying with requirements of authorities having jurisdiction for nontoxic and low VOC content.
4. Overall Thickness: Not less than [1-1/2 inches (38 mm)]
5. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location indicated.
6. Color(s): [As indicated by manufacturer's designations] .

2.2 UNITARY SYNTHETIC DUAL-DENSITY SEAMLESS SURFACE

A. Surface System: Poured-in-place, two-layer system with wearing course over cushion course. Provide manufacturer's standard thickness for each layer as required for overall thickness indicated, tested for impact attenuation according to ASTM F 1292[and for accessibility according to ASTM F 1951].

1. Products: Subject to compliance with requirements.

2. Wearing Course: Formulation of EPDM rubber particles, with minimum of 20 percent and maximum of 26 percent of ethylene propylene-diene-saturated polymethylene main chain along with other organic and inorganic components.
3. Cushion Course: Manufacturer's standard formulation of [**35% recycled**] SBR particles and polyurethane, site mixed and applied.
4. Binder: Weather-resistant, UV-stabilized, flexible, nonhardening, 100 percent solids polyurethane complying with requirements of authorities having jurisdiction for nontoxic and low VOC content.
5. Lacquer Top Coat: Manufacturer's standard polyurethane-based formulation.
6. Overall Thickness: Not less than [1-1/2 inches (38 mm)] .
7. Primer/Adhesive: Manufacturer's standard primer and weather-resistant, moisture-cured polyurethane adhesive suitable for unit, substrate, and location indicated.
8. Wearing Course Color(s): [As indicated by manufacturer's designations] .

2.3 GEOSYNTHETICS

A. Drainage/Separation Geotextile: Nonwoven, needle-punched geotextile, manufactured for subsurface drainage applications and made from polyolefins or polyesters. Complying with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Weight: [4 oz./sq. yd. (136 g/sq. m)] according to ASTM D 5261.
2. Water Flow Rate: [150 gpm/sq. ft. (102 L/s per sq. m)] according to ASTM D 4491.

B. Molded-Sheet Drainage Panel: Prefabricated, composite drainage panels made with drainage core and filter fabric.

1. Drainage Core: Three-dimensional, nonbiodegradable, molded-plastic-sheet material designed to effectively drain water under maximum fill pressures.
2. Fabric: Nonwoven, needle-punched geotextile, specifically manufactured as a filter geotextile and made from polyolefins or polyesters; complying with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

    a. Weight: [4 oz./sq. yd. (136 g/sq. m)] according to ASTM D 5261.
    b. Water Flow Rate: [150 gpm/sq. ft. (102 L/s per sq. m)] according to ASTM D 4491.

3. Minimum Flow Rate: [9 gpm/foot (1.9 L/s per m)] according to ASTM D 4491.

C. Weed-Control Barrier: Composite fabric geotextile consisting of woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, weighing not less than 4.8 oz./sq. yd. (160 g/sq. m).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content, subgrade and substrate conditions, drainage, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Prepare substrates to receive surfacing products according to paving surface system manufacturer's written instructions. Verify that substrates are sound and without high spots, ridges, holes, and depressions.

1. Repair unsatisfactory surfaces and fill holes and depressions.

3.3 INSTALLATION, GENERAL

A. General: Comply with paving surface system manufacturer's written installation instructions. Install playground surface system over area and in thickness indicated.

3.4 GEOSYNTHETIC INSTALLATION

A. General: Install geosynthetics according to paving surface system manufacturer's and geosynthetic manufacturer's written instructions.

1. Geotextiles: Completely cover area indicated, overlapping sides and edges a minimum of [6 inches (150 mm)] with [manufacturer's standard treatment for] [overlapping loosely laid] [adhesively bonded] seams.

3.5 INSTALLATION OF SEAMLESS PAVING SURFACE SYSTEMS

A. Seamless Surface: Mix and apply components of playground surface system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface and impact-attenuating system of total thickness indicated.

1. Substrate Primer: Apply over prepared substrate at manufacturer's standard spreading rate for type of substrate.

2. Poured Cushion Course: Spread evenly over primed substrate to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation, with a minimum of cold joints.
3. Intercoat Primer: Over cured cushion course, apply primer at manufacturer's standard spreading rate.
4. Wearing Course: Spread over primed base course to form a uniform layer applied at manufacturer's standard spreading rate in one continuous operation and, with [a minimum of] cold joints. Finish surface to produce manufacturer's standard wearing-surface texture.

5. Lacquer Topcoat: Spray or roller applied at manufacturer's standard coating rate in one continuous operation.
6. Edge Treatment: [As indicated]. Fully adhere edges to substrate with full coverage of substrate. Maintain fully cushioned thickness required to comply with safety performance requirements.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: [Owner will engage] a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of completed applications of playground surface system shall take place according to ASTM F 1292.

C. Remove and replace applications of playground surface system where test results indicate that it does not comply with requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with requirements.

3.7 PROTECTION

A. [Seamless] Systems: Prevent traffic over system for not less than 48 hours after installation.

END OF SECTION 321816.13

GEOPRODUCTS, LLC
8615 Golden Spike Lane
Houston, Texas 77086
Toll Free: (800) 434-4743
Phone: (281) 820-5493
Fax:(281) 820-5499
Website: www.geoproducts.org

PRODUCT GUIDE SPECIFICATION

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat, SectionFormat,* and *PageFormat,* contained in the CSI *Manual of Practice.*

The section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the drawings.

Delete all "Specifier Notes" when editing this section.

SECTION 02375

CELLULAR CONFINEMENT SYSTEM

Specifier Notes: This section covers GeoProducts, LLC "EnviroGrid®" Three-Dimensional Cellular Confinement System. Consult GeoProducts for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

Specifier Notes: Edit the following sentence as required for the project.

A. Cellular confinement system (geocells) for [load support].

1.2 RELATED SECTIONS

Specifier Notes: Edit the following list as required for the project. List other sections with work directly related to this section.

A. Section 02300 - Earthwork.

B. Section 02315 - Excavation and Fill: Infill material.

C. Section 02340 - Soil Stabilization: Geotextiles.

D. Section 02370 - Erosion and Sedimentation Control.

1.3 REFERENCES

Specifier Notes: List standards referenced in this section, complete with designations and titles. This article does not require compliance with standards, but is merely a listing of those used.

A. ASTM D 1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.

B. ASTM D 1603 - Standard Test Method for Carbon Black In Olefin Plastics.

C. ASTM D 5394 - Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics.

D. ASTM D 5199 - Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.

E. US Army Corps of Engineers (USACE) Technical Report GL-86-19, Appendix A.

1.4 SUBMITTALS

A. Comply with Section 01330 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data and installation instructions.

C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, cell depth, and system components.

D. Samples: Submit manufacturer's sample of geocells.

E. Certificate of Compliance: Submit manufacturer's certificate of compliance indicating geocells comply with specified requirements.

F. Quality Assurance Certification: Submit manufacturer's ISO 9001:2000 quality assurance certification.

G. Warranty: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer's Field Representative Qualifications: Experienced in cellular confinement system installation.

B. Installer's Qualifications: Experienced in cellular confinement system installation.

Specifier Notes: Describe requirements for a meeting to coordinate the installation of the geocells and to sequence related work. Delete the following paragraph if not required.

C. Pre-installation Meeting: Convene pre-installation meeting [2 weeks] before start of installation of geocells. Require attendance of parties directly affecting work of this section, including Contractor, Engineer, installer, and manufacturer's representative. Review preparation, installation, and coordination with other work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened pallets and packaging, with labels clearly identifying product name and manufacturer.

B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. GeoProducts, LLC, 8615 Golden Spike Lane, Houston, Texas 77086; toll free (800) 434-4743; phone (281) 820-5493; fax (281) 820-5499; web site www.geoproducts.org; or approved equal.

2.2 CELLULAR CONFINEMENT SYSTEM

Specifier Notes: Specify EnviroGrid EGA 20, EGA 30, or EGA 40.

A. Model: EnviroGrid EGA 20.

Specifier Notes: Specify cell depth.

1. Cell Depth: [150 mm (6.0 inches)] .
2. Nominal Expanded Cell Size: 259 mm (10.2 inches) wide by 224 mm (8.8 inches) long.
3. Nominal Expanded Cell Area: 289 cm^2 (44.8 square inches).
4. Nominal Expanded Section: 2.56 m (8.4 feet) wide by 6.52 m (21.4 feet) long.
5. Cells per Section: 10 cells wide by 29 cells long.
6. Nominal Expanded Section Area: 16.7 m^2 (180 square feet).
7. Weld Spacing: 355 mm plus or minus 3 mm (14.0 inches plus or minus 0.12 inch).

Specifier Notes: The following material properties apply to all EnviroGrid models.

D. Material Properties:
1. Material: Virgin, non-thermally degraded, high-density polyethylene (HDPE).
2. Polymer Density, ASTM D 1505: 0.95 – 0.965 g/cm^3 (58.4 – 60.2 lb/ft^3).
3. Environmental Stress Crack Resistance, ASTM D 5394 >400 hours.
4. Minimum Carbon Black Content, ASTM D 1603: 1.5 percent by weight.
5. Nominal Sheet Thickness, ASTM D 5199: 1.25 mm (50 mils) plus or minus 5 percent if smooth or 1.5 mm (60 mils) plus or minus 5 percent if textured.
6. If textured the polyethylene strip shall be textured with a multitude of rhomboidal (diamond shape) indentations. The rhomboidal indentations shall have a surface density of 22 to 31 per cm^2 (140 to 200 per in^2).

Specifier Notes: Include seam peel strength based on specified cell depth.

6. Seam Peel Strength, USACE Technical Report GL-86-19, Appendix A:
   a. Cell Depth 150 mm (6.0 inches): 2,130 N (480 pounds).

7. Seam Hang Strength: 102-mm (4.0-inch) weld joint supporting load of 72.5 kg (160 pounds) for 30 days minimum or for 7 days minimum while undergoing temperature change from 23 degrees C (74 degrees F) to 54 degrees C (130 degrees F) on 1-hour cycle.

Specifier Notes: Specify solid or perforated cell wall.

E. Cell Wall: Perforated.

1. Horizontal Rows: 10-mm diameter holes, 16.6 mm on center.
2. Stagger horizontal rows and separate 8.3 mm relative to hole centers.
3. Edge of Cell Wall to Nearest Edge of Perforations: 7.93 mm.
4. Centerline of Weld to Nearest Edge of Perforations: 27.9 mm minimum.
5. Perforations Remove: 13 percent plus or minus 5 percent of cell wall area.

Specifier Notes: Specify section length. Determine section length by using 0.74-foot cell length for EnviroGrid EGA 20, 0.95-foot cell length for EnviroGrid EGA 30, and 1.55-foot cell length for EnviroGrid EGA 40.

G. Section Length: _____ m (__0.74__ feet).

Specifier Notes: Specify color of the geocells. Black with carbon black is standard. Consult GeoProducts for availability of custom colors.

A colored strip stabilized with HALS can be substituted to blend in with the surrounding environment for retaining wall colored fascia strips. Delete fascia strips if they are not required.

H. Color: [Black] .

2.3 ACCESSORIES

Specifier Notes: Consult GeoProducts for assistance in specifying accessories for the specific application.

A. J-Hooks:
1. Material with sufficient strength to support and anchor geocells.

B. Straight Stakes:
1. Material with sufficient strength to support and anchor geocells.
2. Material: [Steel reinforcing bars, uncoated].
3. Diameter: As indicated on the drawings.
4. Length: As indicated on the drawings.

Specifier Notes: GeoProducts does not provide tendons. The Engineer must choose the tendon material. Tendons are manufactured to specific tensile and elongation requirements determined by the Engineer. Consult GeoProducts for additional information.

Specify polyester tendons when using all infill materials, except concrete. Specify polypropylene tendons when concrete is used as the infill material.

2.4 INFILL MATERIAL

Specifier Notes: Cellular confinement systems allow the use of various types of infill materials for unique and aesthetic applications. Consult GeoProducts for additional information.

Specify the required infill material. Provide the section number.

A Infill Material: [Gravel] [Crushed stone] [#57 stone (base) and #89 stone (topdress)] as specified in Section 02315 .

Specifier Notes: Include the following if nonwoven geotextiles are required by the design.

2.5 OTHER GEOSYNTHETIC COMPONENTS

A. Nonwoven Geotextiles: As specified in Section 02340.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine area to receive geocells. Notify Engineer if area is not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.

Specifier Notes: Many variables affect the preparation, installation, and performance of cellular confinement systems (geocells), including slope grade, subsurface stability, infill material, rainfall, artificial watering, hydraulic characteristics of the ground water flow, and subbase anchoring quality. Due to the large number of factors, it is difficult to apply exact parameters to individual applications without depending on engineering, design, and environmental inputs of on-site professionals.

3.2 PREPARATION

A. Prepare site by removing vegetative cover, debris, and unacceptable soils from area where geocells will be installed.

B. Replace removed soils with acceptable materials.

C. Complete earthwork, including toe-in trenches when required for slope or channel lining applications, as specified in Section 02300.

Specifier Notes: Include the following sentence if nonwoven geotextiles are required by the design.

D. Install nonwoven geotextiles as specified in Section 02340.

3.3 INSTALLATION

A. Install geocells in accordance with manufacturer's instructions at locations indicated on the drawings.

B. Anchor geocell sections as necessary to resist sliding due to gravitational forces and sheet flow.

C. Ensure top edges of adjoining cell walls are flush with each other and in proper alignment.

D. Deliver infill material to geocells from top of slope or channel to bottom in accordance with manufacturer's instructions.

E. Limit drop height of infill material to a maximum of 1 m (3 feet) to prevent damage to geocells.

Specifier Notes: Include the following two sentences when using all infill materials, except concrete.

F. Overfill expanded geocell sections by 25 to 50 mm (1 to 2 inches) to allow for settling and compaction, when using granular infill materials.

G. Compact granular infill materials to top of geocells to a minimum of 95 percent SPDD.

END OF SECTION

Manufacturer's Field Representative:
Cal Callahan
MCCA, Inc.
Canton, GA
770-335-5485 cell
calmccainc@aol.com

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work by Owner.
5. Work under separate contracts.
6. Future work.
7. Purchase contracts.
8. Owner-furnished products.
9. Contractor-furnished, Owner-installed products.
10. Access to site.
11. Coordination with occupants.
12. Work restrictions.
13. Specification and drawing conventions.
14. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: Harrison Park Trails Project, NRT-09(7).

1. Project Location:

McCuthchen Street, Ellijay, Georgia 30540.

B. Owner: The City of Ellijay, 197 North Main Street, Ellijay, GA 30540.

1. Owner's Representative:

Mayor Al Hoyle (706) 635.4711

C. Architect: Anne Wilfer (404) 610.1025.

D. Contractor: <**Insert name and contact information for Contractor**> has been engaged as Contractor for this Project.

E. Construction Manager: Anne Wilfer (404) 610.1025.

1. Construction Manager has been engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and Contractor, according to a separate agreement between Owner and Construction Manager.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Site Clearing, Grading and Installation of Trail, Parking and Boat Launch Area Paving.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 WORK BY OWNER

A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Preceding Work: Owner will perform the following construction operations at Project site. Those operations are scheduled to be substantially complete before work under this Contract begins.

1. Clearing of obstructing vegetation and trash removal.

C. Concurrent Work: Owner will perform the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.

1. Trail centerline staking. Any hand work such as rolling out landscape fabric, securing Envirogrid (j-hooks), shoveling, raking, etc.

D. Subsequent Work: Owner will perform the following additional work at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory work under this Contract.

1. Installation of trail marker and park rules signs.

1.6 PURCHASE CONTRACTS

A. General: Owner has negotiated purchase contracts with suppliers of material and equipment to be incorporated into the Work. Owner will assign these purchase contracts to Contractor. Include costs for purchasing, receiving, handling, storage if required, and installation of material and equipment in the Contract Sum, unless otherwise indicated.

1. Contractor's responsibilities are same as if Contractor had negotiated purchase contracts, including responsibility to renegotiate purchase and to execute final purchasing agreements.

1.7 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products.

B. Owner-Furnished Products:

1. Envirogrid (or equivalent), J-Hooks, Landscape Fabric

1.8 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

1. Limits: Limit site disturbance, including earthwork and clearing of vegetation, to 10 feet (3 m) beyond surface walkways, patios, surface parking, and utilities less than 12 inches (300 mm) in diameter; 15 feet (4.5 m) beyond primary roadway curbs and main utility branch trenches; and 25 feet (7.6 m) beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.

2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.9 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work hours from 7:00 a.m. to 7:00 p.m., Monday through Friday, unless otherwise indicated.

1. Weekend Hours: None, without prior approval from Owner..

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify [Owner] not less than [two] days in advance of proposed utility interruptions.
2. Obtain [Owner's] written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify [Owner] not less than [two] days in advance of proposed disruptive operations.
2. Obtain [Owner's] written permission before proceeding with disruptive operations.

E. Employee Identification: [Provide] identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

F. Employee Screening: Comply with Owner's requirements for [drug] [and] [background] screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations [published as part of the U.S. National CAD Standard] [and] [scheduled on Drawings].

3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.11 MISCELLANEOUS PROVISIONS

A. <**Insert miscellaneous provisions**>.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
2. Section 017300 "Execution" for progress cleaning of Project site.
3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
5. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.3 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of [10] days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by [Architect]. Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain [Architect's] signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit sustainable design submittals required in Section 018113.13 "Sustainable Design Requirements - LEED for New Construction and Major Renovations," Section 018113.16 "Sustainable Design Requirements - LEED for Commercial Interiors," Section 018113.19 "Sustainable Design Requirements - LEED for Core and Shell Development," and Section 018113.23 "Sustainable Design Requirements - LEED for Schools" and in individual Sections.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of [10] days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.

2. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
3. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
4. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
5. Complete final cleaning requirements, including touchup painting.
6. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of [10] days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect[and Construction Manager] will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect[and Construction Manager] will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.[Use CSI Form 14.1A.]

1. Organize list of spaces in sequential order.

2. Include the following information at the top of each page:

a. Project name.
b. Date.
c. Name of Owner[and Construction Manager].
d. Name of Contractor.
e. Page number.

3. Submit list of incomplete items in the following format:

a. MS Excel electronic file. Owner, through Construction Manager,] will return annotated file.
b. PDF electronic file. Owner[, through Construction Manager,] will return annotated file.
c. [Three] paper copies. Owner[, through Construction Manager,] will return [two] copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within [15] days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling

navigation to each item. Provide bookmarked table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.
f. Remove debris and surface dust from limited access spaces.
g. Remove labels that are not permanent.
h. Leave Project clean and ready for occupancy.

C. Construction Waste Disposal: Comply with waste disposal requirements in [Section 015000 "Temporary Facilities and Controls."] [Section 017419 "Construction Waste Management and Disposal."]

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

END OF SECTION 017700

DRAWINGS

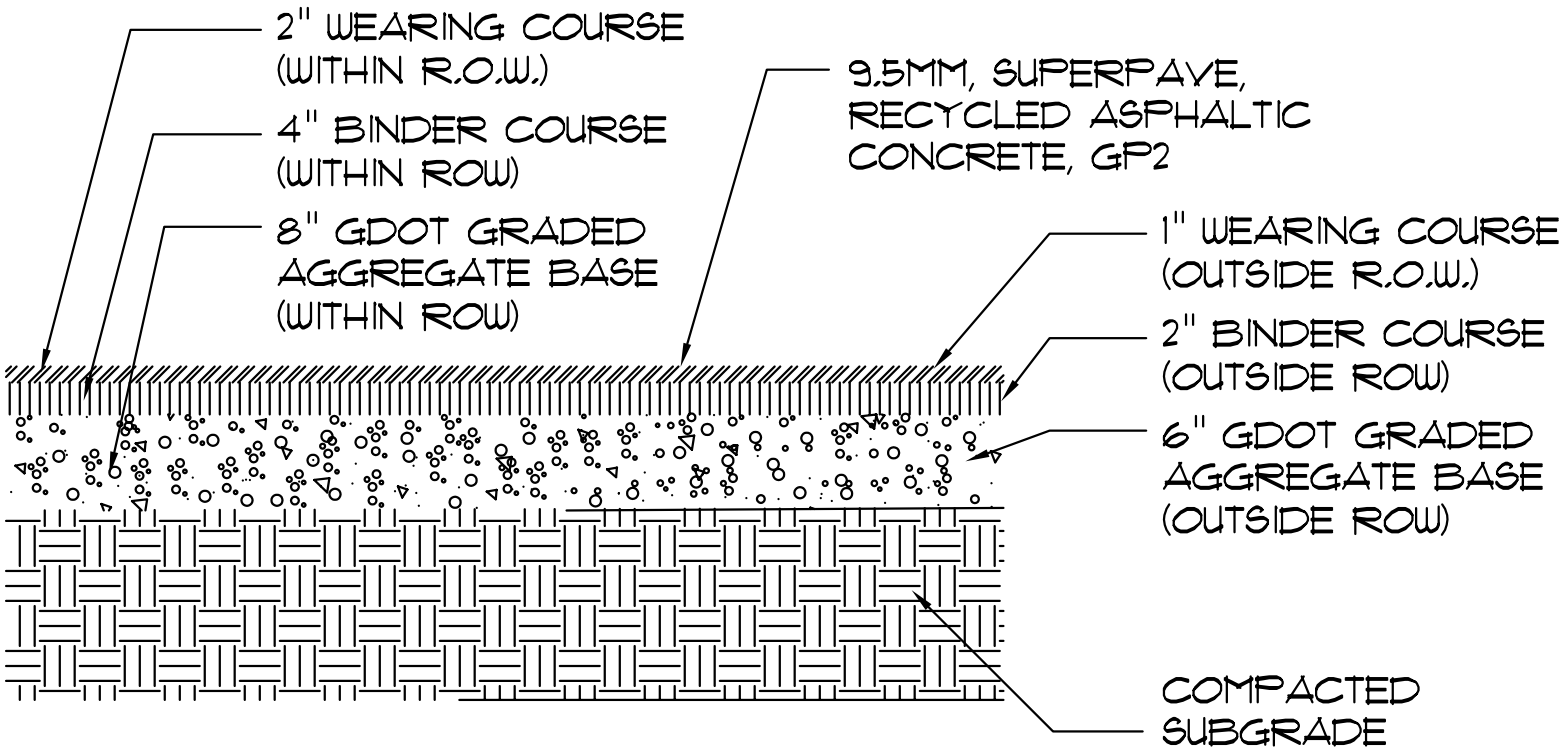
Harrison Memorial Park

Conceptual Plan

0 60 120 180

Scale: 1" = 60'-0"

Date: August 11, 2009

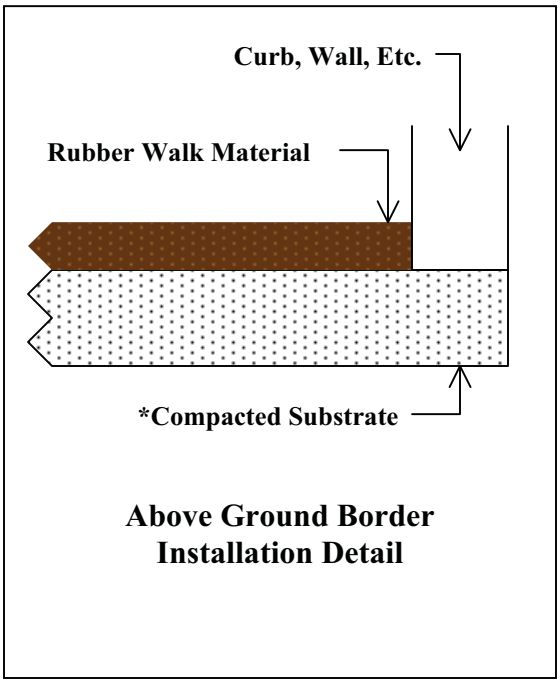


3
L6.1

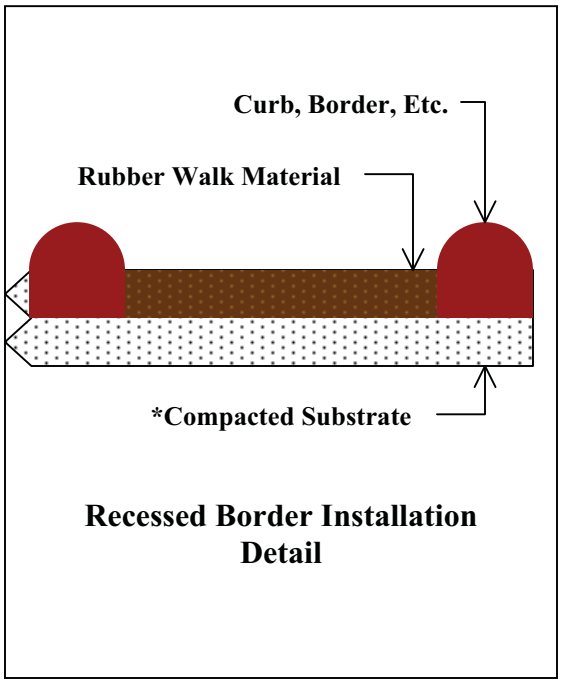
ASPHALT PAVING

SCALE 1" = 1'-0"

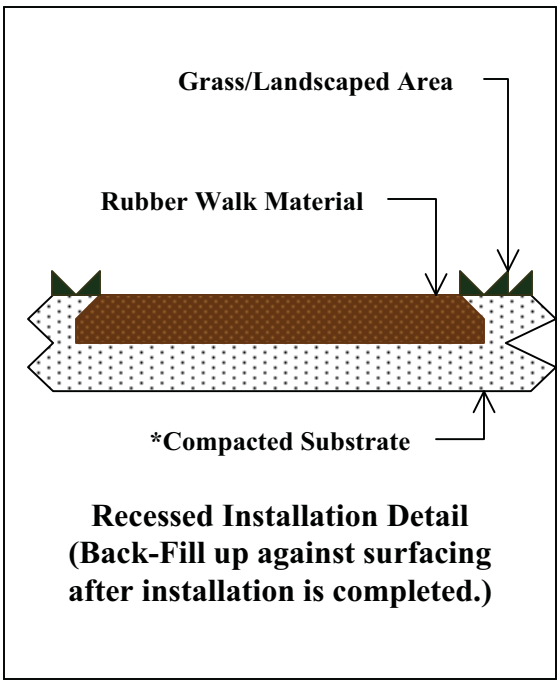
Rubber Walk Pour-N-Place Edge Detail



Above Ground Border Installation Detail



Recessed Border Installation Detail



Recessed Installation Detail (Back-Fill up against surfacing after installation is completed.)

Notes:

*Compacted Substrate: Unlike the EPDM Pour-N-Place, the Rubber Walk may be installed over any compacted surface which does not wash and exhibits positive drainage. This includes concrete, asphalt, and granite dust. A non-woven textile will be used when using a granite dust substrate.

Rubber Walk Product Information

Composition	**Special blend of colored rubber mulch and a polyurethane binder**
Applications	**Accessible Walking Trails, Playgrounds, and Erosion Control**
Installation Method	**Single Density Wet Pour, Troweled On-Site**
Testing	**ASTM F-1292-96 "Standard Specifications for Impact Attenuation of Surface Systems Under and Around Playground Equipment"** **ASTM F-1951-99 "Surface Accessibility Test"** **ASTM D 2859 "Flammability (Pill) Test"** **CRI TM-101 "Creating Surface Appearance Changes in Pile Yarn Floor Covering from Foot Traffic", Wear Retention Test**
Maintenance	**Remove any loose debris with a blower or broom. For heavily soiled areas, use a garden hose and a light soap and scrub with a soft bristled brush. Rinse thoroughly.**

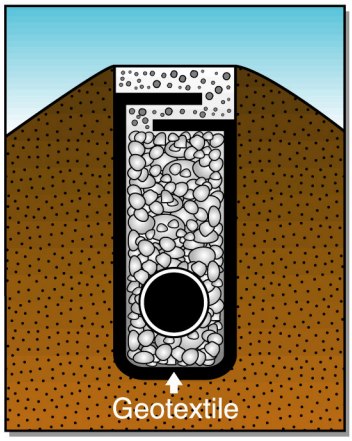
US 115NW

3904 Virginia Ave • Cincinnati, Ohio 45227 • Phone (513) 271-6000 • Fax (513) 271-4420

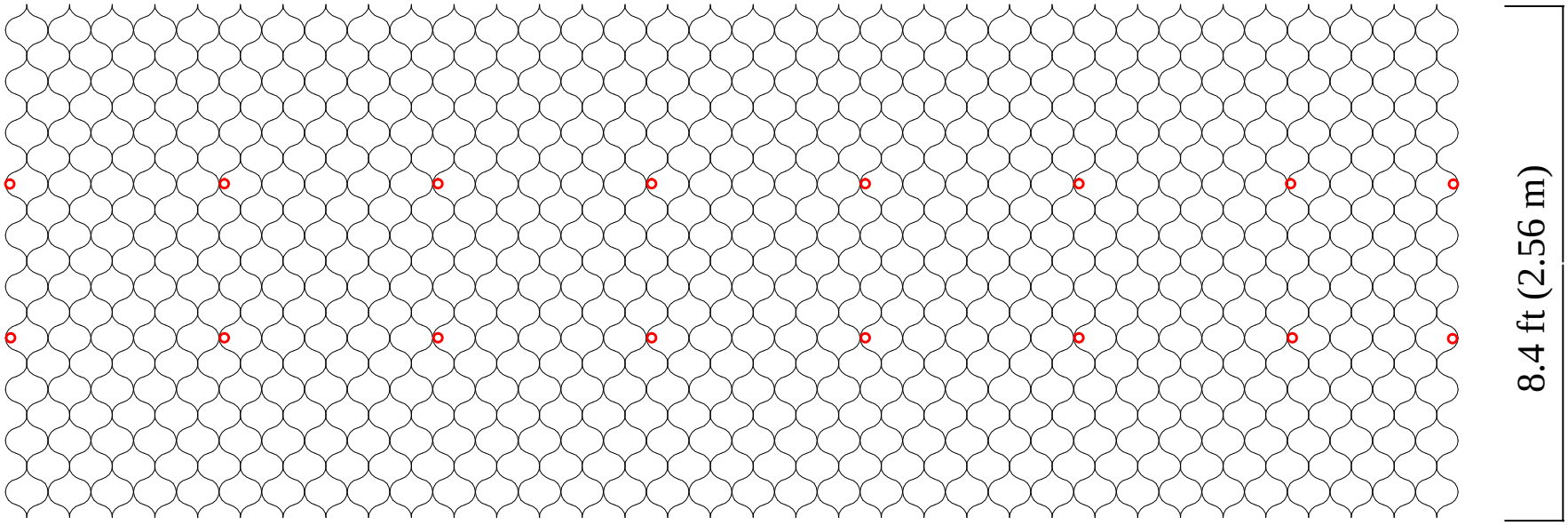
Nonwoven Geotextile

A 4.0 oz/sy nonwoven needlepunched geotextile made of 100% polypropylene staple filaments. Primarily used in drainage applications, this product prevents soil fines from entering the system, extending drain life and performance. US 115NW can also be used in lightweight separation applications. US 115NW will satisfy the strength requirements of AASHTO M 288 96/99 Class 3.

Drainage



PROPERTY	TEST METHOD	ENGLISH	METRIC
Tensile Strength	**ASTM D-4632**	**115 lbs**	**512 N**
Elongation @ Break	**ASTM D-4632**	**50 %**	**50 %**
Mullen Burst	**ASTM D-3786**	**215 psi**	**1481 kPa**
Puncture Strength	**ASTM D-4833**	**65 lbs**	**289 N**
Trapezoidal Tear	**ASTM D-4533**	**50 lbs**	**222 N**
Apparent Opening Size	**ASTM D-4751**	**70 US Sieve**	**0.212 mm**
Permittivity	**ASTM D-4491**	**2.0 Sec^{-1}**	**2.0 Sec^{-1}**
UV Resistance, % Retained	**ASTM D-4355**	**70 %**	**70 %**
Flow Rate	**ASTM D-4491**	**140 gal/min/sf**	**5689 $1/min.m^2$**



Typical 16 Pin Staking Pattern:
The Red Circles represent J-Hooks

ENVIROGRID™

By PCL	EGA 30 - 10 x 34 - Cell Panel	Rev # 0
Scale: None	Date: 01/25/11	Drawing No. EnvStd-021

Envirogrid Permeable Trail Solution

1. Silty Loam Sub-base
2. Nonwoven Geotextile
3. EGA206 Cellular Confinement
4. Infilled with #57 stone